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G03F 7/004(21)Application number : **2001-013231**(71)Applicant : **FUJI PHOTO FILM CO LTD**(22)Date of filing : **22.01.2001**(72)Inventor : **MAEMOTO KAZUO**
HOSHI SATOSHI**(54) ORIGINAL PLATE FOR LITHOGRAPHIC PRINTING PLATE**

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an original plate for a heat mode-type lithographic printing plate which need not be developed and has abroad-the-printing machine development properties enabling the plate to be made up by directly mounting the plate on the printing machine and further, shows outstanding resistance to print scumming on the printing face and plate wear with the ability to record an image by a photothermal conversion action under laser beam scanning.

SOLUTION: This original plate for the lithographic printing plate has an imaging layer which contains (A) a polymer including a constituent unit with an organic salt structure or a polymer having a hydrophilic graft group in the side chain and a surface hydrophilic fine particle which contains an infrared absorbing dye and turns lipophilic by heat and (B) a water-soluble polymer.

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CLAIMS

[Claim(s)]

[Claim 1] The original edition for the lithography versions characterized by having the image formation layer which contains polymer and an infrared-absorption color including the composition unit which has (A) organic-salt structure on a hydrophilic base material, and contains the surface hydrophilic-property particle which changes with heat to lipophilic property, and (B) water-soluble polymer.

[Claim 2] The original edition for the lithography versions characterized by having the image formation layer which contains the polymer and the infrared-absorption color which have a hydrophilic graft machine in the (A) side chain, and contains the surface hydrophilic-property particle made lipophilic with heat, and (B) water-soluble polymer on a hydrophilic base material.

[Claim 3] The original edition for the lithography versions according to claim 1 or 2 to which the aforementioned water-soluble polymer is characterized by being the polymer which has water-soluble celluloses, the poly (meta) acrylamide, a sulfonic acid, or its salt, gum arabic, a polyvinyl pyrrolidone, and the poly (meta) acrylic acid.

[Claim 4] The original edition for the lithography versions according to claim 1 or 2 characterized by being the polymer from which the aforementioned surface hydrophilic-property particle polymer has salt structure of an infrared-absorption color.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the negative for lithography of development needlessness. In more detail, it can engrave by the image recording in heat mode, and the image recording by the scanning exposure based on the digital signal is also possible, a printing machine is equipped, platemaking and printing are possible, without moreover developing negatives, and it is related with printing dirt and the negative for the lithography versions excellent in ****-proof.

[0002]

[Description of the Prior Art] Generally, the lithography version consists of the picture section of the lipophilic property which receives ink in printing process, and the non-picture section of the hydrophilic property which receives dampening water. As such a negative for the lithography versions, the PS plate which prepared the photopolymer layer of lipophilic property on the hydrophilic base material is widely used from the former.

[0003] In connection with the digitization technology which uses a computer, and accumulates [processes it and] and outputs image information electronically on the other hand having spread widely, the new picture output method corresponding to such digitization technology is used increasingly variously. The image information digitized by one of them at a radiant ray of high astringency like a laser beam is supported, scanning exposure of the negative is carried out with this light, and the computer toeplate technology of manufacturing the direct printing version through a lith film attracts attention. Therefore, it has been an important technical technical problem to obtain the negative for the printing versions which was adapted for this purpose.

[0004] since the thing of high power can receive cheaply by solid state laser, such as semiconductor laser and an YAG laser, recently, promising ** of the platemaking method of using the laser of these which is easy to build into digitization technology as an image recording means by scanning exposure, and manufacturing the printing version is carried out the image of the negative side by the platemaking method of the conventional method, give image Mr. exposure of a low - inside illuminance to a photosensitive negative, and according to photochemical reaction -- physical-properties change [like] Although image recording is performed, by the method using the exposure of high-power density using high power laser, carry out concentration irradiation of a lot of light energies between the exposure times momentary to an exposure field, transform a light energy into heat energy efficiently, thermal changes, such as a chemical change, a phase change, and a gestalt, change of structure, are made to start with the heat, and the change is used for image recording. That is, image recording is recorded by the reaction by heat energy although image information is inputted by light energies, such as a laser beam. Usually, the recording method using generation of heat by such high-power density exposure is called heat mode record, and it is calling it light-and-heat conversion to change a light energy into heat energy.

[0005] The picture which did not expose the big advantage of the platemaking method using a heat mode record means with the light of usual illuminance level like indoor lighting, and was recorded by high illuminance exposure has fixing in it not being indispensable. That is, if a heat mode sensitized

material is used for image recording, before exposure, it is safe to indoor light, and fixing of a picture is not indispensable after exposure. Therefore, if heat mode record is used, it is also expected that it becomes possible to obtain the negative for the lithography versions which is easy to develop also to a computer toeplate method.

[0006] As one of the desirable manufacturing methods of the lithography version based on heat mode record, a hydrophobic image formation layer is prepared on the substrate of a hydrophilic property, heat mode exposure is carried out, the solubility and the dispersibility of a hydrophobic layer are changed to the shape of a picture, and the way a wet developing removes the non-picture section if needed is proposed. For example, the method of obtaining the printing version is indicated by JP,46-27919,B by carrying out heat mode record of the negative which prepared the record layer containing a saccharide, a melamine formaldehyde resin, etc. whose solubility improves with heat on the hydrophilic base material. this indication technology was begun, generally, since sensible-heat nature was not enough, to heat mode scanning exposure, the hydrophobic/hydrophilic discrimination of the irradiation section and the non-irradiating section with inadequate therefore sensitivity of the simple platemaking technology of the heat mode record currently indicated conventionally, i.e., discernment nature, was small, and they had become restrictions of practicality

[0007] As a means of the solution, the method (called ablation) of carrying out heat scattering and removing the picture layer of the irradiation section is also indicated by irradiation of the laser beam of high power by operation of heat at WO 98/No. 40212, WO 98/No. 34796, JP,6-199064,A, etc. Although the discernment nature of the irradiation field and the non-irradiating field where, as for this method, heat scattering was performed that it is sure and completely is large The dirt of the equipment by the scattering object and the dirt of a printing side spoil operation of equipment and printing quality upwards, and Since original discernment nature will not be demonstrated but printing quality will be reduced, if the heat of irradiation light does not often attain to the deep part of an image formation layer, but there is a phenomenon of **** which remains without the picture layer pars basilaris ossis occipitalis near a base material dispersing and there is ****. The cure is desired.

[0008] as technology of avoiding this fault, change by the surface hydrophilic property and the heat of a hydrophobic degree, i.e., a polar change, is used without being based on ablation, even if it is the image formation by optical irradiation in heat mode -- as the simple platemaking method For example, thermoplastic polymer, such as a hydrophobic wax and a polymer latex, is added in a hydrophilic layer, the method of making carry out phase separation to a front face with heat, and carrying out hydrophobing is proposed in JP,44-22957,B, JP,58-199153,A, US No. 3,168,864, WO 99/No. 4974 official report, etc., and the one direction of a discernment nature improvement means is suggested. The negative for lithography which prepared the photosensitive layer which distributed the particle of a thermoplastic hydrophobic polymer in hydrophilic binder polymer on the hydrophilic base material is indicated by Japanese JP,2938397,B. It is indicated by this official report that it attaches on a printing machine cylinder and on-board development can be carried out in dampening water and ink after it performs infrared-laser exposure to this negative for lithography, and it makes the particle of a thermoplastic hydrophobic polymer coalesce with heat and it carries out image formation. Moreover, after making a thermoplastic particle coalesce also in JP,9-127683,A and WO No. 10186 [99 to] official report with heat, producing the printing version by on-board development is indicated. However, an improvement is desired that such indication technology runs short of discernment nature, that heat dissolution sensitivity is not high enough, by a hydrophilic property being further insufficient and being anxious about printing dirt, etc.

[0009]

[Problem(s) to be Solved by the Invention] Therefore, the purpose of this invention is offering the original edition for the lithography versions which conquered the fault of the above advanced technology. That is, it is also to be able to engrave simply without needing a development, to equip a printing machine directly, and to engrave to offer the negative for the lithography versions of the heat mode type in which the image recording by light-and-heat conversion operation of a laser beam scan is possible with which it has possible on-board development nature, and much more improvement was

further achieved in the printing dirt and ****-proof on a printing side.

[0010]

[Means for Solving the Problem] That the above-mentioned purpose should be attained, this invention person etc. found out conquering the fault of the aforementioned conventional technology by adopting the following composition, as a result of inquiring wholeheartedly. That is, this invention is as follows.

(1) The original edition for the lithography versions characterized by having the image formation layer which contains polymer and an infrared-absorption color including the composition unit which has (A) organic-salt structure on a hydrophilic base material, and contains the surface hydrophilic-property particle which changes with heat to lipophilic property, and (B) water-soluble polymer.

(2) The original edition for the lithography versions characterized by having the image formation layer which contains the polymer and the infrared-absorption color which have a hydrophilic graft machine in the (A) side chain, and contains the surface hydrophilic-property particle made lipophilic with heat, and (B) water-soluble polymer on a hydrophilic base material.

(3) The original edition for the lithography versions the above (1) characterized by the aforementioned water-soluble polymer being the polymer which has water-soluble celluloses, the poly (meta) acrylamide, a sulfonic acid, or its salt, gum arabic, a polyvinyl pyrrolidone, and the poly (meta) acrylic acid, or given in (2).

(4) The original edition for the lithography versions the above (1) characterized by being the polymer from which the aforementioned surface hydrophilic-property particle polymer has salt structure of an infrared-absorption color, or given in (2).

[0011] The negative for lithography of this invention is the original edition for the particle heat weld type lithography versions which attaches on a printing machine cylinder and produces the printing version on-board development in dampening water and ink after it performs infrared-laser exposure, and it makes the thermoplastic particle in an image formation layer coalesce with heat and it carries out image formation. When it prepares by the emulsification distribution-solvent evaporating method, polyvinyl alcohol, especially partial saponification polyvinyl alcohol can distribute stably the polymer particle examined in the past about the thermoplastic particle (henceforth a polymer particle) which the above-mentioned image formation layer is made to contain. Moreover, in manufacture of the distributed liquid of a polymer particle, a surfactant can distribute stably according to an emulsion polymerization. However, when the polyvinyl alcohol or the surfactant used for the above-mentioned distribution stuck to the support surface, the cause and bird clapper of printing dirt made it clear.

[0012] As a result of examining wholeheartedly the dispersant of the polymer particle which is the trouble of the above-mentioned original edition for the particle heat weld type lithography versions, when the polymer which has water-soluble celluloses, a polyacrylamide, a sulfonic acid, or its salt, gum arabic, a polyvinyl pyrrolidone, the poly (meta) acrylic acid, etc. were used as an alternative of the above-mentioned polyvinyl alcohol or a surfactant, printing dirt decreased and it found out that it was effective in prevention of dirt nature. However, the above-mentioned resin has the inadequate performance which distributes lipophilic property polymer, and was not able to be applied immediately. It is compatible in printing dirt prevention and dispersibility ability, and it became clear that polymer other than the above-mentioned polyvinyl alcohol is also compatible in printing dirt prevention and dispersibility ability to give salt structure to the polymer which constitutes particle polymer, or by introducing a hydrophilic radical as a graft side chain as a result of examining wholeheartedly the particle polymer dispersed system which can discover the outstanding printing dirt prevention effect. Moreover, particle heat weld nature is bad, since the hydrophilic property of a particle interface is large, when a light-and-heat conversion agent (infrared-absorption color) is out of a particle, heat weld efficiency increases by introducing a light-and-heat conversion agent in a particle, although there was a problem which becomes inadequate [****-proof], and dirt nature is good, and it became possible to give ****-proof [quantity].

[0013]

[Embodiments of the Invention] The original edition for the lithography versions of this invention is explained in detail below. First, the image formation layer which is the feature portion of the original

• edition for the lithography versions of this invention is explained.

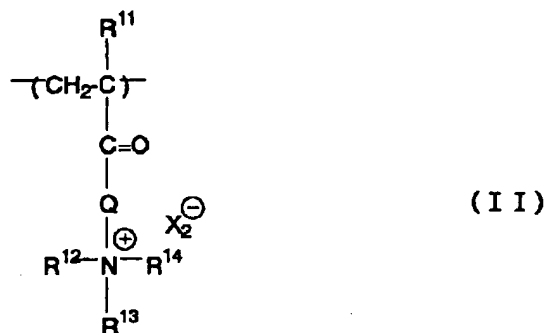
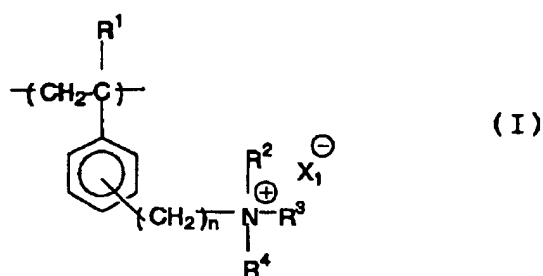
[Image formation layer] Although the image formation layer of the original edition for the lithography versions of this invention contains the polymer and the infrared-absorption color which have a hydrophilic graft machine in a side chain preferably, including the composition unit which has (A) organic-salt structure and contains the surface hydrophilic-property particle which changes with heat to lipophilic property, and (B) water-soluble polymer, it can contain the other below-mentioned additives further.

[0014] (Surface hydrophilic-property particle) the water which dissolved the polymer and the infrared-absorption color which are beforehand obtained with the surface hydrophilic-property particle used in this invention in the organic solvent, and contained the water soluble resin in it -- in addition, after carrying out emulsification distribution, it can prepare by evaporating a solvent These are explained below. There is polymer without the salt structure of having hydrophilic groups, such as polymer which has salt structure with an organic alkali, polymer which has salt structure with the organic acid, a hydroxyl group, an amide group, and a carboxylic-acid machine, to a graft chain as polymer which can be used by this method. In order to prevent weld of resin particles about these resins, a glass transition temperature needs to be 60 degrees C or more, and a glass transition temperature 80 degrees C or more is still more preferably good. In order to give [and] a hydrophilic property to a particle, preventing the dissolution and swelling of a particle, it is desirable that the acid number or a base number is the resin which has the salt structure where a part of synthetic resin [at least] below 4.0 milliequivalents / g was neutralized by the organic base or the organic acid more than 0.3 milliequivalents / g as a resin. It is desirable that more than 50 mol % of the acid radical of synthetic resin or a basic group is neutralized from the base or the acid. A hydrophilic property can be raised to the resin particle of the non-picture section more than at 50 mol %, and ink dirt can be made small.

[0015] Although especially the anionic functional group that gives the acid number to synthetic resin is not limited, it can give the surface hydrophilic-property resin particle of the difficulty of becoming dirty with good sulfonic group and phosphate group for a carboxylic-acid machine, a sulfonic group, a sulfinic-acid machine, a phosphate group, etc. Such an acid-radical content resin can be obtained by the copolymer or copolycondensation of acid-radical content monomers and a lipophilic property monomer. As an example of acid-radical content monomers, an acrylic acid, a methacrylic acid, a crotonic acid, an itaconic acid, a maleic acid, a fumaric acid, itaconic-acid monobutyl, maleic-acid monobutyl, acid phosphoxyethyl methacrylate, acid phosphoxy propyl methacrylate, an acrylamide-isobutane sulfonic acid, or 2-sulfoethyl methacrylate can be mentioned, for example. As for the basic polymer used for this invention, it is desirable that it is the unit expressed with the following general formula (I) or (II).

[0016]

[Formula 1]



[0017] In the above-mentioned general formula (I) and (II), R¹¹, R¹², R¹³, and R¹⁴ are R¹, R², R³ and R⁴, and homonymy in order, respectively. Q is the bivalent basis of the carbon atomic numbers 1-20. as the example an alkylene machine (an example, a methylene, ethylene) and an arylene machine (an example and -Ph-R- [-- however] to which Ph expresses 1 and 4-phenylene group, and R expresses the alkylene machine or single bond of the carbon atomic numbers 1-6, - OR -- '[, however R' Express Alkylene Machine of Carbon Atomic Numbers 1-6 (Example --) oxyethylene and oxy-trimethylene], - O-Ph-R-, and -Ph-O-R- [-- however] whose Ph(s) are the above and homonymy, and -NHR'-, -N(R'') R'-[-- however R -- ' -- the above -- homonymy -- it is -- R -- " -- carbon -- an atomic number -- one -- -- six -- an alkyl group -- or -- carbon -- an atomic number -- seven -- -- 12 -- an aralkyl -- a machine -- expressing --] -- -- NH-Ph-R -- ' -- -- Ph-NH-R -- ' -- -- N (R'') -- -- Ph-R -- -- [-- however -- R -- R -- ' -- and -- R -- " -- the the X₂- of a general formula (II) is X₁- and homonymy. As for R¹¹, it is desirable that they are a hydrogen atom or a methyl group.

[0018] As for R¹², R¹³, and R¹⁴, it is desirable to express the alkyl group which has no replacing or the hydroxyl of a hydrogen atom and the carbon atomic numbers 1-3, the alkyl group in which R¹² and R¹³ form a piperidine in, and R⁴ has no replacing or the hydroxyl of the carbon atomic numbers 1-3, or the above-mentioned aralkyl machine. Q - QR -- ' - or - NHR -- ' - [-- however -- R -- ' -- ethylene -- a propylene -- expressing --] -- being desirable .

[0019] The base or acid for giving the above synthetic resin has big influence on the hydrophilic property of this resin particle, and the lipophilic property of the weld resin coat by laser beam irradiation. When a base or an acid is an inorganic base or an inorganic acid, the lipophilic property of the heat weld coat by laser beam irradiation is not enough, and it becomes inadequate ink impressing [of the picture section] it. Therefore, it is desirable to consider as salt structure by the organic base or the organic acid. Therefore, as a base, amines and quarternary ammonium salt are desirable. Triethylamine tetramethylammonium hydroxide is raised especially. As a desirable acid, organic sulfonic acids, for example, Para toluenesulfonic acid, are raised.

[0020] Skeletons other than an organic-salt content skeleton are obtained by copolymerizing the following monomers. For example, styrene system monomers (aromatic vinyl monomer), such as styrene, vinyltoluene, 2-methyl styrene, t-butyl styrene, or chloro styrene : An acrylic-acid methylene, An ethyl acrylate, an acrylic-acid isopropyl, acrylic-acid n-butyl, Isobutyl acrylate, an acrylic-acid n-amyl, an acrylic-acid isoamyl, An acrylic-acid n-hexyl, acrylic-acid 2-ethylhexyl, an acrylic-acid n-octyl, Various acrylic esters, such as an acrylic-acid desyl or an acrylic-acid dodecyl : A methacrylic-acid methyl, Methacrylic-acid ethyl, a methacrylic-acid isopropyl, methacrylic-acid n-butyl, A

methacrylic-acid isobutyl, a methacrylic-acid n-amyl, a methacrylic-acid isoamyl, A methacrylic-acid n-hexyl, methacrylic-acid 2-ethylhexyl, A methacrylic-acid n-octyl, A methacrylic-acid desyl or various methacrylic-acid ester: (meta), such as a methacrylic-acid dodecyl, -- various hydroxyl content monomer:, such as acrylic-acid hydroxyethyl or (meta) acrylic-acid hydroxypropyl, -- N-methylol (meta) acrylamide Or various N-substitution (meta) acrylic monomers, such as an N-butoxy (meta) acrylamide, can be mentioned.

[0021] The copolymer drawn with the combination of the above monomer may be a copolymer with polymerization nature unsaturation machine content oligomer depending on the case. You may use what has an acid radical into the polymerization nature unsaturation machine content oligomer which furthermore starts. As such polymerization nature unsaturation machine content oligomer, vinyl denaturation polyester, vinyl denaturation urethane, or a vinyl denaturation epoxy compound can be mentioned, for example. As an example, a polymerization nature unsaturated bond (vinyl group) is introduced by the polycondensation of various compounds, such as a maleic anhydride, a fumaric acid, tetrahydro phthalic anhydride and a methylene tetrahydro maleic anhydride, alpha-TERUBINEN maleic-anhydride addition product, monoallyl ether of triol, pen TAERI slit diaryl ether, or allyl glycidyl ether, or addition.

[0022] Furthermore, in order to make an acid radical introduce into polyester, what what has a carboxyl group at the end by it is obtained that what is necessary is just because the dibasic acid like a phthalic acid is used superfluously, or has an acid radical in a principal chain by use of trimellitic anhydride is obtained.

[0023] Moreover, as the above-mentioned vinyl denaturation urethane, it is obtained according to the addition polymerization of the various kinds of polyols and diisocyanate including glycerol monoallyl ether or 1, and 2-combination like a butadiene polyol etc., for example. Or vinyl combination is introduced into an end by the addition reaction of the urethane and the hydroxyl-group content polymerization nature monomers which have an isocyanate machine etc. Moreover, an acid component can be made to introduce into polyurethane also by adding dimethylol propionic acid etc. as a polyol component.

[0024] As monochrome methacrylate of a polyethylene glycol, the average molecular weight of a polyoxyethylene chain can mention the thing of 1,000-4,000 within the limits, for example.

[0025] Moreover, as a vinyl denaturation epoxy compound, the thing to which the carboxyl group of the end epoxy group of an epoxy resin, an acrylic acid, or a methacrylic acid was made to react can be mentioned, for example.

[0026] Furthermore, the oligomer of the polymerization nature monomers which have the polymerization nature vinyl group which made the glycidyl group content polymerization nature monomer add to a carboxyl group content vinyl copolymer is obtained. Although the polymerization nature monomers used here showed above, it is chosen from inside.

[0027] In addition, it is marketed as a macro monomer, for example, the oligomer of the end vinyl denaturation of the Toagosei chemical industry (**) can also be used together. Needless to say, if it is the oligomer which has a polymerization nature vinyl group, it will not be limited to the kind or method which were mentioned above.

[0028] (Resin which has a hydrophilic graft machine) The resin which has the hydrophilic graft machine which next does not have salt structure is explained. It is the copolymerization resin obtained by copolymerizing other ethylene nature monomers other than these in hydrophilic macromere, such as an ethylene nature monomer or acrylamide macromere and N-vinyl pylori DOMMAKUROMA acrylic-acid bitter taste roamer which has a polyalkylene glycol machine and/or a hydroxyl group as a hydrophilic graft machine. The polymer particle into which the hydrophilic graft chain concerning this invention was introduced is producible using the well-known method generally learned as a synthesis method of a graft polymer. Specifically, composition of a graft polymer is indicated by "graft polymerization and its application" Ide [Fumio] work, the Showa 52 issue, a macromolecule publication meeting and the volume new macromolecule experiments 2 and for "composition [of a macromolecule] / reaction" Society of Polymer Science, Japan, and Kyoritsu shuppan Co., Ltd. 1995,

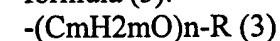
Inc.

[0029] Composition of a graft polymer is fundamentally divided into the three methods of carrying out a branch monomer polymerization of combining a branch macromolecule with 2. trunks macromolecule and of carrying out [make / (the macromere method)] copolymerization of the branch macromolecule to 3. trunks macromolecule from 1. trunk macromolecule. Especially although all can be used among these three methods and the hydrophilic layer of this invention can be created, from manufacture fitness and a viewpoint of control of a membrane structure, the macromere method of 3 is excellent.

[0030] The composition and atomization of a graft polymer which used macromere are indicated by above "composition [of the new macromolecule experiment study 2 and a macromolecule] / reaction" Society of Polymer Science, Japan editing, and Kyoritsu shuppan Co., Ltd. 1995, Inc. Moreover, it is indicated in detail by the chemistry of a macroscopic monomer, and Yamashita ***** "industrial" editorial-supervision "design [of a functional supermolecule], and future view" CMC 1998 besides eye BISHI 1989 and Naoya Ogata. As a hydrophilic monomer, specifically An acrylic acid (meta) or its alkali, An amine salt, an itaconic acid or its alkali, an amine salt, 2-hydroxyethyl (meta) acrylate, An acrylamide, N-monochrome methylol (meta) acrylamide, (Meta) N-dimethylol (meta) acrylamide, 3-vinyl propionic acid, or its alkali, An amine salt, a vinyl sulfonic acid or its alkali, an amine salt, 2-sulfoethyl (meta) acrylate, Polyoxy-ethylene-glycol monochrome (meta) acrylate, a 2-acrylamide-isobutane sulfonic acid, Acid phosphoxy polyethylene-glycol monochrome (meta) acrylate, Hydroxyl groups, such as an allylamine or its mineral-acid salt, a carboxyl group, or its salt, According to a method given in reference, hydrophilic macromere is compoundable using a kind at least out of the hydrophilic monomer which has hydrophilic radicals, such as a sulfonic group or its salt, a phosphoric acid or its salt, an amide group, an amino group, and an ether machine.

[0031] Among the hydrophilic macromere used by this invention, especially a useful thing The macromere guided from the monomer of carboxyl group content, such as an acrylic acid and a methacrylic acid A 2-krill amide-isobutane sulfonic acid, a vinylstyrene sulfonic acid, And the sulfonic-acid system macromere, N-vinyl acetamide which are guided from the monomer of the salt, The amide system macromere guided from N-vinyl carboxylic-acid amide monomers, such as N-vinyl formamide Hydroxyethyl methacrylate, hydroxyethyl acrylate, The macromere guided from hydroxyl-group content monomers, such as glycerol monochrome methacrylate It is macromere guided from alkoxy groups, such as methoxy ethyl acrylate, methoxy polyethylene-glycol acrylate, and polyethylene-glycol acrylate, or an ethylene oxide machine content monomer. Moreover, the monomer which has a polyethylene-glycol chain or a polypropylene-glycol chain can also be used useful as macromere of this invention.

[0032] Specifically, the polyalkylene glycol machine in this invention is shown by the following formula (3).



One or more integers and n of {, however m are two or more integers, and R is hydrogen and a hydrocarbon group. }

[0033] This polyalkylene glycol machine is desirable, m is 1 to 6 and n is 2 to 23. Moreover, R is hydrogen or the alkyl group of carbon numbers 1-4 preferably.

[0034] As for a polyalkylene glycol machine, it is desirable to be given to the water-dispersion resin of this invention by the polymerization of the ethylene nature monomer which has a polyalkylene glycol machine. The ethylene nature monomer which has a polyalkylene glycol machine has a polyalkylene glycol machine and a polymerization nature unsaturation double bond. In addition, in this specification, an ethylene nature monomer is a compound which has a polymerization nature unsaturation double bond, and a macro monomer (reactant polymer which has at least one polymerization nature unsaturation double bond) is included. Typically, an acrylic-acid (meta) system monomer can be mentioned.

[0035] As an ethylene nature monomer which has a polyalkylene glycol machine, the acrylic acids (meta) esterified by the polyalkylene glycol machine can be mentioned, for example. Specifically Polyethylene-glycol (meta) acrylate, methoxy polyethylene-glycol (meta) acrylate, Ethoxy polyethylene-glycol (meta) acrylate, propoxy polyethylene-glycol (meta) acrylate, Butoxy polyethylene-glycol (meta)

acrylate, polypropylene-glycol (meta) acrylate, Methoxy polypropylene-glycol (meta) acrylate, ethoxy polypropylene-glycol (meta) acrylate, Propoxy polypropylene-glycol (meta) acrylate, butoxy polypropylene-glycol (meta) acrylate, Polytetramethylene glycol (meta) acrylate, methoxy polytetramethylene glycol (meta) acrylate, Ethoxy polytetramethylene glycol (meta) acrylate, propoxy polytetramethylene glycol (meta) acrylate, Butoxy polytetramethylene glycol (meta) acrylate, poly pentamethylene-glycol (meta) acrylate, Methoxy poly pentamethylene-glycol (meta) acrylate, ethoxy poly pentamethylene-glycol (meta) acrylate, Propoxy poly pentamethylene-glycol (meta) acrylate, butoxy poly ** NTAMECHIREN glycol (meta) acrylate, Polyhexamethylene glycol (meta) acrylate, methoxy polyhexamethylene glycol (meta) acrylate, Ethoxy polyhexamethylene glycol (meta) acrylate, propoxy polyhexamethylene glycol (meta) acrylate, butoxy polyhexamethylene glycol (meta) acrylate, etc. can be mentioned. Also in these ethylene nature, preferably, m is 1-6 and n is 2 to 23. Moreover, R is hydrogen or the alkyl group of carbon numbers 1-4 preferably.

[0036] The ethylene nature monomer which has the polyalkylene glycol machine of this invention can be used combining one kind or two kinds or more.

[0037] the inside of these macromere -- useful molecular weight -- the range of 400-100,000, and the desirable range -- 1000-50,000 -- the ranges especially of the desirable range are 1500-20,000

Polymerization nature with the copolymerization monomer in which molecular weight cannot form the polymer particle of self-dispersibility in or less by 400, and forms a principal chain or more by 100,000 becomes bad.

[0038] It is chosen out of the polymer [which constitutes the core portion of the hydrophobic-ized precursor which has a hydrophilic graft chain in connection with this invention] particle in which it is hydrophobic and the polymer particle of heat dissolution nature has a thermoplastic polymer particle, a thermosetting polymer particle, and a thermal reaction nature functional group.

[0039] As suitable thermoplastic particle polymer for this invention, it is in January, 1992. The thermoplastic particle polymer of a publication can be mentioned to a Research Disclosure No.33303, JP,9-123387,A, 9-131850 official report, 9-171249 official report, 9-171250 official report, and EP No. 931647 official report etc. as a suitable thing. As an example, the homopolymer, the copolymers, or those mixture of a monomer, such as acrylic resin, such as ethylene, styrene, a vinyl chloride, and a methyl-acrylate ethyl-acrylate methyl-methacrylate ethyl methacrylate, a vinylidene chloride, acrylonitrile, and vinylcarbazole, can be mentioned. In it, polystyrene and a polymethyl methacrylate can be mentioned as a more suitable thing.

[0040] As suitable thermosetting resin for this invention, the resin which has a phenol skeleton, a urea system resin (for example, thing which resinified the ureas derivative, such as a urea or a methoxymethyl-ized urea, by aldehydes, such as formaldehyde), a melamine system resin (for example, thing which resinified a melamine or its derivative by aldehydes, such as formaldehyde), alkyd resin, an unsaturated polyester resin, a polyurethane resin, an epoxy resin, etc. can be mentioned.

[0041] The methacrylate which has phenol skeletons, such as methacrylamide which has phenol skeletons, such as phenol resin which resinified a phenol, cresol, etc. by aldehydes, such as formaldehyde, hydroxy styrene resin, and N-(p-hydroxyphenyl) methacrylamide, as a resin which has a suitable phenol skeleton, for example or an acrylamide resin, and N-(p-hydroxyphenyl) methacrylate, or an acrylate resin can be mentioned. Especially, especially desirable things are the resin which has a phenol skeleton, melamine resin, a urea-resin, and an epoxy resin.

[0042] There is the method of dissolving these compounds in the organic solvent of non-water solubility, and carrying out the mixed emulsification of this with the solution containing hydrophilic macromere as the synthetic method of such a particle, and applying heat further, carrying out vacuum evaporatio removal of the organic solvent, and solidifying in the shape of a particle. Moreover, in case thermosetting resin is compounded by the emulsion polymerization, the distributed polymerization, etc., you may atomize. However, it does not restrict to these methods.

[0043] (Introduction of a reactant machine) As a thermal reaction nature functional group of the polymer which the particle used for this invention has the ethylene nature unsaturation machine (for example, an acryloyl machine and a methacryloyl machine --) which performs polymerization reaction The

functional group which has the active hydrogen atom which are isocyanato groups which perform an addition reaction, such as a vinyl group and an allyl group, or a block object of those, and its reactional phase hand The amino group which are for example, (the amino group, the hydroxyl, carboxyl group, etc. and epoxy groups) which similarly perform an addition reaction, and its reactional phase hand, A carboxyl group or a hydroxyl, the carboxyl group which performs a condensation reaction and a hydroxyl or the amino group, the acid anhydride which performs a ring breakage addition reaction and the amino group, or a hydroxyl can be mentioned. However, if a chemical bond is formed, the functional group which performs what reaction is sufficient.

[0044] What has the basis which protected an acryloyl machine, a methacryloyl machine, a vinyl group, an allyl group, an epoxy group, the amino group, a hydroxyl, a carboxyl group, an isocyanate machine, an acid anhydride, and them as particle polymer which has the thermal reaction nature functional group used for the image formation layer of this invention can be mentioned. Although it is more desirable to perform introduction to the polymer particle of these functional groups at the time of a polymerization, you may perform it after a polymerization using a macromolecule reaction.

[0045] When introducing at the time of a polymerization, it is desirable an emulsion polymerization or to carry out the suspension polymerization of the monomer which has these functional groups. As an example of the monomer which has such a functional group, allyl-compound methacrylate, Allyl-compound acrylate, vinyl methacrylate, vinyl acrylate, The block isocyanate by glycidyl methacrylate, glycidyl acrylate, 2-isocyanate ethyl methacrylate, or its alcohol, The block isocyanate by 2-isocyanate ethyl acrylate or its alcohol, Although 2-aminoethyl methacrylate, 2-aminoethyl acrylate, 2-hydroxyethyl methacrylate, 2-hydroxyethyl acrylate, an acrylic acid, a methacrylic acid, a maleic anhydride, 2 organic-functions acrylate, 2 organic-functions methacrylate, etc. can be mentioned It is not limited to these.

[0046] Although the mean particle diameter of the particle which uses the above-mentioned thermoplasticity, thermosetting, or thermal reaction nature polymer as a core has desirable 0.01-20 micrometers, also in it, its 0.04-1.0 micrometers are still more desirable, and its 0-05-0.50 micrometers are especially the optimal. Within the limits of this, good resolution and stability with the passage of time are acquired.

[0047] From a viewpoint of the melt viscosity at the time of softening, and the film strength at the time of melting, the range of 3,000-100,000 is desirable still more desirable, and the ranges of the weight average molecular weight of these macromolecules are 5,000-50,000. The film strength at the time of weld does not become enough, but when molecular weight is larger than 100,000, the melt viscosity of softening will stop, fully welding low what has molecular weight smaller than 3,000 on the other hand.

[0048] If the organic solvents which dissolve synthetic resin in the first-stage story which creates a particle by the emulsification distribution-solvent evaporating method are glycol-ether system solvents, such as ester system solvents, such as aromatic system solvents, such as chlorine-based solvents, such as alcoholic system solvents, such as ketone system solvents, such as an acetone and a methyl ethyl ketone, a methanol, ethanol, and isopropyl alcohol, chloroform, and a methylene chloride, benzene, and toluene, and ethyl-acetate ester, an ethylene glycol monomethyl ether, and an ethylene glycol wood ether, they are usable.

[0049] Although the amount of this organic solvent used will not be specified especially if the effect in this invention is attained, its amount from which the weight ratio of a synthetic-resin + infrared-absorption color / this organic solvent is set to 1 / 1 - 1/20 is desirable.

[0050] A surfactant, a plasticizer, a color coupler, etc. can be added to the above-mentioned synthetic-resin solution as an additive if needed. After carrying out emulsification distribution with a homogenizer etc. with the solution in which the water soluble resin contains the above-mentioned organic-solvent constituent, the particle which a solvent is evaporated and corresponds can be prepared. 70% of the weight or more of the image formation layer constituent solid content of the addition of these polymer particles is desirable, and its 80 % of the weight or more is still more desirable from a viewpoint of ****-proof.

[0051] (Light-and-heat conversion agent) It is necessary to contain an infrared-absorption color to the

particle of tree invention. The pigment or the metal is already in the particle state, and its compatibility with the polymer material in a particle is bad, and will stop being able to weld it easily. What is necessary is just to have an absorption band at least in a 700-1200nm part as an infrared-absorption color.

[0052] as a color, the well-known color indicated by a commercial color and reference ("color handbook" Society of Synthetic Organic Chemistry, Japan edit and Showa 45 -- development of the functionality coloring matter of the 90s, and the "near-infrared absorption coloring matter" "commercial-scene trend" chapter 2 2.3rd term (1990) -- CMC), or the patent can be used [for example,] [of annual-publications "chemical-industry" 1968 year 5 month number P.45-51] Specifically, infrared-absorption coloring matter, such as azo dye, metallic complex azo dye, pyrazolone azo dye, an anthraquinone dye, a phthalocyanine dye, a carbonium color, a quinonimine dye, and the poly methine dye, is desirable.

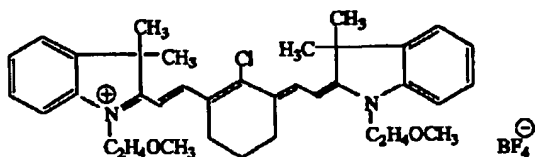
[0053] Furthermore, for example, JP,58-125246,A, JP,59-84356,A, Cyanine dye, JP,58-173696,A which are indicated by JP,60-78787,A etc., The methine dye indicated by JP,58-181690,A, JP,58-194595,A, etc., JP,58-112793,A, JP,58-224793,A, JP,59-48187,A, The naphthoquinone color indicated by JP,59-73996,A, JP,60-52940,A, JP,60-63744,A, etc., The SUKUWARIRIJUMU color indicated by JP,58-112792,A etc., Cyanine dye given in British JP,434,875,B, and a color given in U.S. Pat. No. 4,756,993, Cyanine dye given in U.S. Pat. No. 4,973,572, a color given in JP,10-268512,A, and a phthalocyanine compound given in JP,11-235883,A can be mentioned.

[0054] Moreover, a near-infrared absorption sensitizer given in U.S. Pat. No. 5,156,938 is also suitably used as a color. Moreover, the ARIRUBENZO (thio) pyrylium salt by which the U.S. Pat. No. 3,881,924 publication was replaced, TORIME tin thia pyrylium salt given in JP,57-142645,A, JP,58-181051,A, 58-220143, 59-220143, 59-41363, 59-84248, 59-84249, 59-146063, The pyrylium system compound indicated by 59-146061, cyanine dye given in JP,59-216146,A, Pentamethine thio pyrylium salt etc. and JP,5-13514,B given in U.S. Pat. No. 4,283,475, the pyrylium compound currently indicated by the 5-19702 official report and the product made from EPORIN -- EPORAITO III-178, EPORAITO III-130, and EPORAITO III-125 grade are also used preferably The infrared-absorption color introduced into the particle of this invention has the desirable color of lipophilic property, and the following colors can be mentioned as an example.

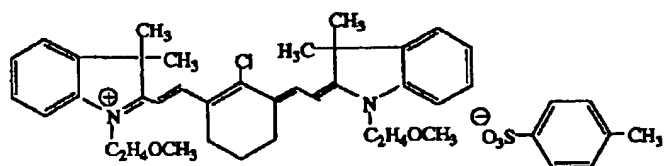
[0055]

[Formula 2]

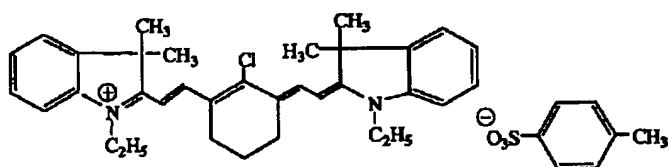
(IR-21)



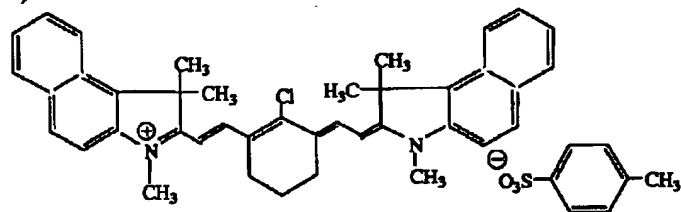
(IR-22)



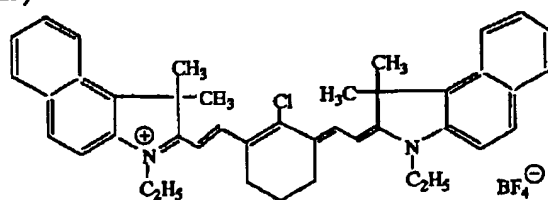
(IR-23)



(IR-24)



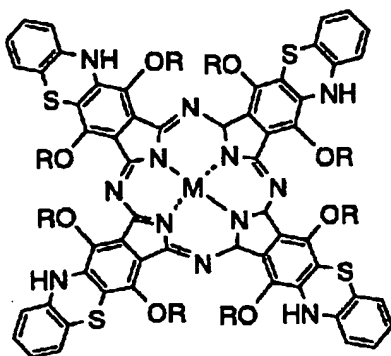
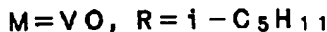
(IR-25)



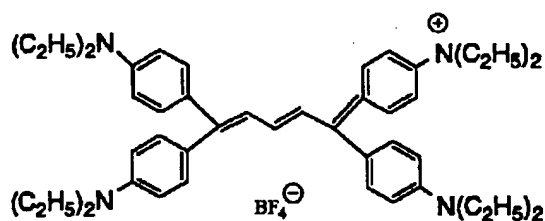
[0056]

[Formula 3]

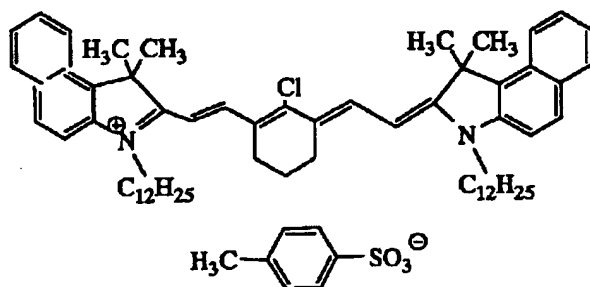
(IR-26)



(IR-27)



(IR-28)



[0057] The infrared-absorption coloring matter of the above-mentioned organic system can be added to 30 % of the weight in a particle. It is 5 - 25 % of the weight preferably, and is 6 - 20 % of the weight especially preferably. Good sensitivity is obtained within the limits of this. When introducing these infrared-absorption colors into a particle, by introducing an acid skeleton, especially a sulfonic-acid skeleton into the macromolecule material of a particle, a color skeleton can be introduced into this macromolecule by salt exchange, and it can do [making it ****-proof / quantity / more or]. It is also possible to introduce infrared-absorption coloring matter into the image formation layer of this invention out of a particle. As infrared-absorption coloring matter, it has an absorption band at least in a 700-1200nm part, and that is good and can use various pigments, a metal particle, and a color.

[0058] As a pigment, the pigment of the infrared-absorption nature indicated by a commercial pigment and a Color Index (C. I.) handbook, the "newest pigment handbook" (volume on Japanese pigment technical association, 1977 annual publications), the "newest pigment applied technology" (CMC publication, 1986 annual publications), and "printing ink technology" (CMC publication, 1984 annual publications) can be used.

[0059] Since these pigments raise the dispersibility over the layer added, well-known surface treatment can be performed and used for them if needed. In the method of surface treatment, the method of

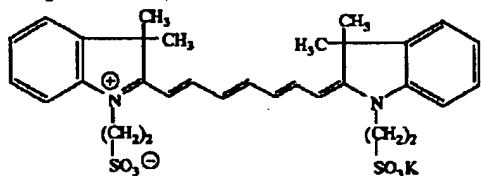
carrying out the surface coat of a hydrophilic resin or the lipophilic property resin, the method to which a surfactant is made to adhere, the method of combining the active substance (for example, a silica sol, an alumina sol, a silane coupling agent, an epoxy compound, an isocyanate compound, etc.) with a pigment front face, etc. can be considered. The pigment added in a hydrophilic layer has that desirable to which the coat of the front face was carried out by the hydrophilic resin or the silica sol so that it may be easy to distribute with a water-soluble resin and a hydrophilic property may not be spoiled. As for the particle size of a pigment, it is desirable that it is in the range of 0.01 micrometers - 1 micrometer, and it is still more desirable that it is in the range which is 0.01 micrometers - 0.5 micrometers. As a method of distributing a pigment, the well-known distributed technology used for ink manufacture, toner manufacture, etc. can be used. As a desirable pigment, carbon black can be mentioned especially.

[0060] A color desirable in these, although it adds in the hydrophilic media in the hydrophilic resin of an image formation layer etc. is a water soluble dye, and shows an example below.

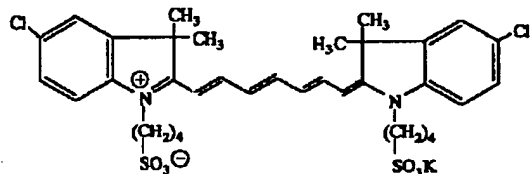
[0061]

[Formula 4]

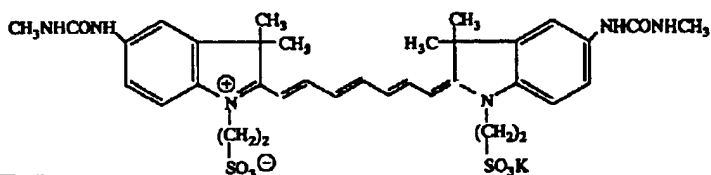
(IR-1)



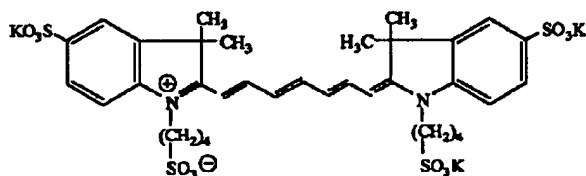
(IR-2)



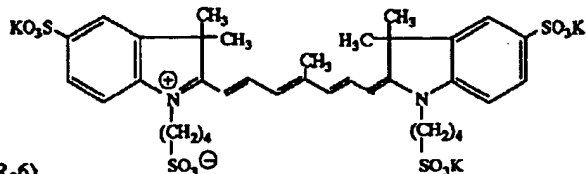
(IR-3)



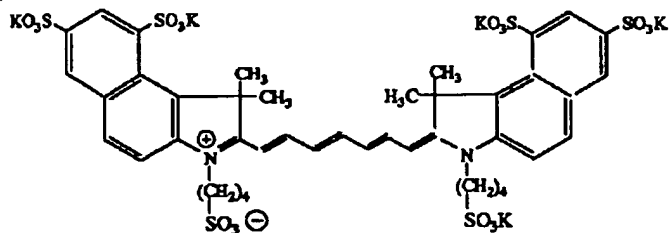
(IR-4)



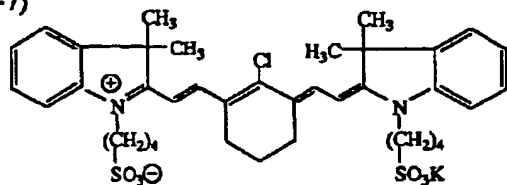
(IR-5)



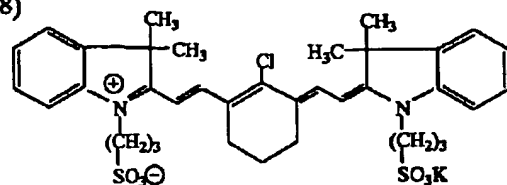
(IR-6)



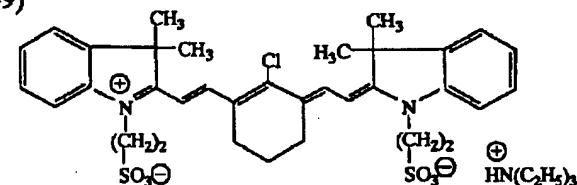
[0062]

[Formula 5]
(IR-7)

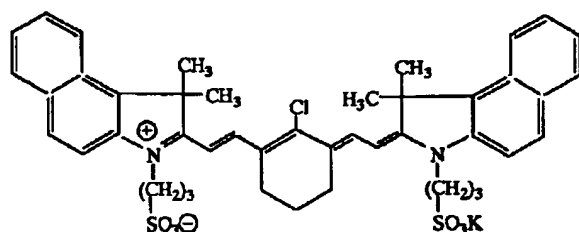
(IR-8)



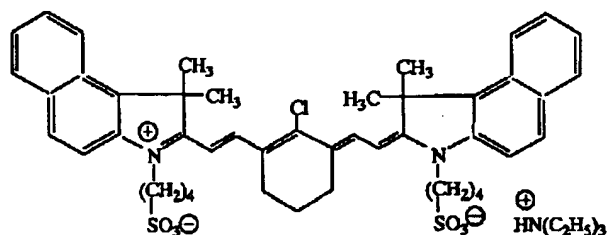
(IR-9)



(IR-10)



(IR-11)



[0063] (Water soluble resin) The negative for the lithography versions of this invention can use a water soluble resin for an image formation layer. 15 or less % of the weight of the image formation layer of the amount of the water soluble resin in that case is desirable, and especially its 10 % of the weight or more is desirable. As a water soluble resin, the macromolecule which has hydrophilic groups, such as a carboxylic acid, an amide, and a sulfonic acid, for example is desirable.

[0064] As a hydrophilic resin being concrete, gum arabic, casein, gelatin, a starch derivative, A carboxymethyl cellulose and its sodium salt, a cellulose acetate, A sodium alginate, vinyl acetate my lane acid copolymers, and styrene-my lane acid copolymers Polyacrylic acids and those salts, polymethacrylic acids, and those salts, The homopolymer and copolymer of hydroxyethyl methacrylate, The homopolymer and copolymer of the homopolymer of hydroxyethyl acrylate and a copolymer, and hydroxypropyl methacrylate, The homopolymer of a polyvinyl pyrrolidone and an acrylamide and a copolymer, the homopolymer of methacrylamide and polymer, the homopolymer of N-MECHIRORU acrylamide and a copolymer, a polyethylene glycol, etc. can be mentioned. The polymer which has water-soluble celluloses, the poly (meta) acrylamide, a sulfonic acid, or its salt from a viewpoint of the difficulty of becoming dirty especially, gum arabic, a polyvinyl pyrrolidone, and the poly (meta) acrylic

acid are desirable.

[0065] (Other additives) After image formation, since distinction of the picture section and the non-picture section is made easy to attach, the color which has big absorption in a light region can be used for the image formation layer of this invention as a coloring agent of a picture again. Specifically Oil yellow #101, oil yellow #103 oil pink #312, the oil green BG An oil blue BOS, oil-blue #603, oil black BY, Oil black BS, oil black T-505 (above product made from Orient Chemical industry), Victoria pure blue, a Crystal Violet (CI42555), Methyl-Violet (CI42535) ethyl violet, Rhodamine B (CI145170B), a Malachite Green (CI42000), a methyl blue (CI52015), etc. can mention the color indicated by JP,62-293247,A. Moreover, pigments, such as a phthalocyanine system pigment, an azo system pigment, and titanium oxide, can also be used suitably. 0.01 - 10 % of the weight of an addition is desirable to an image formation layer application liquid total solid.

[0066] Furthermore, in order to give the flexibility of a paint film etc. if needed, a plasticizer can be added to the image formation layer of this invention. For example, a polyethylene glycol, a tributyl citrate, a diethyl phthalate, dibutyl phthalate, a phthalic-acid dihexyl, a dioctyl phthalate, tricresyl phosphate, tributyl phosphate, trioctyl phosphate, a tetrahydrofurfuryl oleate, etc. are used.

[0067] Although an anion type, a Nonion type, a cation type, and a fluorine-containing mold surfactant can be used as a surfactant for improving the shape of an application side, in order to improve the shape of an application side, a Nonion type surfactant is the most desirable. A poor pinhole-like field top becomes easy to generate a fluorine type surfactant on an application film. Moreover, when a cation nature surfactant is used, it becomes easy to become dirty at the time of printing. The image formation layer of this invention dissolves or distributes each required above-mentioned component to a solvent, prepares application liquid, and is applied. As a solvent used here, ethylene dichloride, a cyclohexanone, A methyl ethyl ketone, a methanol, ethanol, propanol, an ethylene glycol monomethyl ether, 1-methoxy-2-propanol, 2-methoxy ethyl acetate, 1-methoxy-2-propyl acetate, Although dimethoxyethane, methyl-lactate, ethyl-lactate, N, and N-dimethylacetamide, N.N-dimethylformamide, a tetramethyl urea, N-methyl pyrrolidone, dimethyl sulfoxide, a sulfolane, gamma-butyl lactone, toluene, water, etc. can be mentioned It is not limited to this. these solvents are independent -- or it is mixed and used The solid-content concentration of application liquid is 1 - 50 % of the weight preferably. The amount to which these organic solvents remain in the image formation layer is two or less [50mg //m] preferably two or less 100 mg/m. If it becomes more than it, a particle will be welded with a solvent.

[0068] Moreover, although the image formation layer coverage on the base material obtained after an application and dryness (solid content) changes with uses, generally its 0.5 - 5.0 g/m² is desirable. Various methods can be used as a method of applying. For example, a bar coating-machine application, a rotation application spray application, a curtain application, a DIP application, an air knife application, a plate application, a roll application, etc. can be mentioned.

[0069] In the image formation layer application liquid in connection with this invention, the surfactant for improving application nature, for example, a fluorochemical surfactant which is indicated by ** No. 170950 [Showa 62 to], can be added. a desirable addition -- 0.01- of an image formation layer solid content -- it is 0.05 - 0.5 % of the weight still more preferably 1% of the weight The coverage of a sea image formation layer has less than two desirable 0.3g or more 1.0 g/m, and its less than two two or more 0.4 g/m 0.7 g/m is desirable. As for this image formation layer, it is [less than / 0.3 or more / 2.5 / less than / 0.5 or more / 2.0] preferably desirable in that case as photochemistry concentration in laser wavelength to have less than [0.7 or more] 1.5 preferably especially.

[0070] [Overcoat layer] The negative for the lithography versions of this invention can prepare a water-soluble overcoat layer on an image formation layer because of the pollution control of the image formation layer front face by the lipophilic property matter. The water-soluble overcoat layer used for this invention can be easily removed at the time of printing, and contains the resin chosen from the water-soluble organic high molecular compound. As a water-soluble organic high molecular compound used here The coat made by application dryness is what has film organization potency. specifically Polyvinyl acetate (however, thing of 65% or more of adding-water cracking severity), a polyacrylic acid, The alkali-metal salt or an amine salt, a polyacrylic-acid copolymer, its alkali metal, or an amine salt, A

polymethacrylic acid, its alkali-metal salt or an amine salt, a polymethacrylic-acid copolymer, The alkali-metal salt or an amine salt, a polyacrylamide, its copolymer, Polyhydroxy ethyl acrylate, a polyvinyl pyrrolidone, its copolymer, A polyvinyl methyl ether, a vinyl methyl ether / anhydrous maleate copolymer, A Polly 2-acrylamide-2-methyl-1-propane sulfonic acid, The alkali-metal salt or an amine salt, a Polly 2-acrylamide-2-MECHIRU 1-propane sulfonic-acid copolymer, The alkali-metal salt or an amine salt, gum arabic, a fibrin derivative An its (carboxymethyl cellulose, carboxy ethyl cellulose, methyl cellulose, etc. and denaturation) object, a white dextrin, a pullulan, a zymolysis etherification dextrin, etc. can be mentioned. [for example,] Moreover, according to the purpose, two or more sorts can be mixed and these resins can also be used. Moreover, as polymer used for a water-soluble overcoat layer, the aforementioned polar conversion polymer is the point which raises the resistance over the dampening water of the picture section, and raises print durability, and is especially desirable.

[0071] Moreover, in an overcoat layer, you may add the aforementioned water-soluble infrared-absorption coloring matter. Furthermore, in a water-soluble application, non-ion system surfactants, such as the polyoxyethylene nonylphenyl ether and poly POKISHI ethylene dodecylether, can be added in order to secure the homogeneity of an application to an overcoat layer. The dryness coverage of an overcoat layer has desirable 0.1 - 2.0 g/m². Within the limits of this, on-board development nature is not spoiled but a pollution control with the good picture stratification front face by lipophilic property matter, such as fingerprint adhesion dirt, is made.

[0072] [Base material] In the negative for the lithography versions of this invention as a base material which can apply the aforementioned image formation layer It is a tabular object stable in dimension. For example, paper, plastics The paper (which for example, polyethylene, polypropylene, polystyrene, etc. laminated), Metal plates (for example, aluminum, zinc, copper, etc.), plastic film for example, a diacetyl cellulose, a cellulose triacetate, and a cellulose propionate -- A butanoic acid cellulose, a cellulose acetate butyrate, a cellulose nitrate, a polyethylene terephthalate, The metal like the above, such as polyethylene, polystyrene, polypropylene, a polycarbonate, and a polyvinyl acetal, is mentioned for a lamination, the paper by which vacuum evaporatioⁿ was carried out, or plastic film. Polyester film or an aluminum plate is mentioned as a desirable base material.

[0073] This aluminum plate makes a pure-aluminium board and aluminum a principal component, it is an alloy board containing the different element of a particle, and plastics laminates it in the thin film of aluminum or an aluminium alloy further. There are silicon, iron, manganese, copper, magnesium, chromium, zinc, a bismuth, nickel, titanium, etc. in the different element contained in an aluminium alloy. The content of the different element in an alloy is at most 10 or less % of the weight. (Below, aluminum and an aluminium alloy are named generically and aluminum and the sheet from them are called an aluminum plate.) The aluminum plate from aluminum **** using the direct chill casting process may also be an aluminum plate from the ingot by the continuous casting process again. However, the aluminum plate of the material of well-known official business can also be conventionally used for the aluminum plate applied to this invention suitably.

[0074] The thickness of the above-mentioned substrate used by this invention is 0.15mm - 0.3mm especially preferably 0.1mm - 0.4mm preferably 0.05mm - 0.6mm.

[0075] It is desirable to precede using an aluminum plate and to carry out surface treatment, such as split-face-izing of a front face and anodic oxidation. With surface treatment, the improvement in a hydrophilic property and adhesive reservation with an image formation layer become easy.

[0076] Although split-face-ized processing on the front face of an aluminum plate is performed by various methods, it is performed by the method of split-face-izing mechanically, for example, the method of forming a front face into a dissolution split face electrochemically, and the method of carrying out the selective dissolution of the front face chemically. As the mechanical method, well-known methods, such as the ball grinding method, a brushing method, the blast grinding method, and buffing, can be used. The method of flooding with the saturated-water solution of the aluminum salt of a mineral acid which is indicated by JP,54-31187,A as the chemical method is suitable. Moreover, there is the method of performing by an alternating current or direct current in the electrolytic solution which

contains acids, such as a hydrochloric acid or a nitric acid, as an electrochemical split-face-ized method. Moreover, the electrolysis split-face-ized method using the mixed acid can also be used as indicated by JP,54-63902,A.

[0077] As for split-face-izing by the method like the above, it is desirable to be given in the range from which (Ra) is set to 0.2-1.0 micrometers in the center line average coarseness of the front face of an aluminum plate. Anodizing is performed, in order that the split-face-ized aluminum plate may raise abrasion resistance by request, after alkali etching processing is carried out using solution, such as a potassium hydroxide and a sodium hydroxide, if needed and neutralization processing is carried out further. As an electrolyte used for anodizing of an aluminum plate, use of the various electrolytes which form a porosity oxide skin is possible, and, generally a sulfuric acid, a hydrochloric acid, chromic acids, or those mixed acids are used. the concentration of those electrolytes -- an electrolytic kind -- **** arrangement **** Although it cannot generally specify since the processing conditions of anodic oxidation change variously with the electrolyte to be used, if electrolytic concentration is 5-70 degrees C, current density 5 - 60 A/dm², voltage 1-100V, and a range for 10 seconds - electrolysis time 5 minutes, generally it is suitable for a 1 - 80-% of the weight solution, and volume. As for the amount of oxide films formed, it is desirable 1.0 - 5.0 g/m² and that it is especially 1.5 - 4.0 g/m².

[0078] the substrate which is carried out in the above surface treatment and has anodized coating as a base material used by this invention -- for much more improvement of adiathermancy etc. in an adhesive property with the upper layer, a hydrophilic property, and the difficulty of becoming dirty, although you may remain as it is If needed, **** selection can be carried out and expansion processing of the micro pore of the anodic oxide film indicated by the application for patent No. 65219 [2000 to] and the application for patent No. 143387 [2000 to], sealing of a micro pore, surface hydrophilicity-ized processing in which it is immersed in the solution containing a hydrophilic compound, etc. can be performed. As a suitable hydrophilic compound for the above-mentioned hydrophilicity-ized processing, a compound with a polyvinyl phosphonic acid sulfonic group, a saccharide compound, a citric acid, alkali-metal silicate, a zirconium fluoride potassium, phosphate / inorganic fluorine compound, etc. can be mentioned. [0079] When using a base material with the hydrophilic property of front faces, such as polyester film, inadequate as a base material of this invention, it is desirable to apply a hydrophilic layer and to make a front face into a hydrophilic property. The hydrophilic layer containing the colloid of the oxide of at least one element ****(ed) [application for patent / No. 10810 / 2000 to] / as a hydrophilic layer from the beryllium, the magnesium, the aluminum, the silicon, the titanium, the boron, the germanium, the tin, the zirconium, the iron, the vanadium, antimony, and transition metals of a publication or a hydroxide which comes to carry out application liquid is desirable. The hydrophilic layer which comes to apply the application liquid containing the oxide of silicon or the colloid of hydroxylation especially is desirable.

[0080] In this invention, before applying an image formation layer, the organic undercoat contained [application for patent / No. 143387 / 2000 to] / polyacrylic acid / inorganic undercoat like a publication, for example, water-soluble metal salts, such as boric-acid zinc, or a carboxymethyl cellulose, a dextrin,] may be prepared if needed. Moreover, you may make this undercoat contain the aforementioned infrared-absorption color.

[0081] [Platemaking and printing] Image formation of the negative for lithography of this invention is carried out by heat. Specifically, although high illuminance flash exposure, such as direct picture Mr. record, scanning exposure by the infrared laser, and a xenon electric-discharge lamp, infrared-lamp exposure, etc. by the heat recording head etc. are used, exposure by solid-state high power infrared laser which emits infrared radiation with a wavelength of 700-1200nm, such as semiconductor laser and an YAG laser, is suitable. A printing machine can be equipped without processing beyond it with the negative for lithography of this invention by which picture exposure was carried out, and it can be printed in the usual procedure using ink and dampening water. Moreover, it is also possible to expose these negatives for lithography with the laser carried in the printing machine after attaching on a printing machine cylinder as indicated by Japanese JP,2938398,B, and to attach and carry out on-board development of dampening water and/or the ink after that. Moreover, after these negatives for

lithography carry out development which makes water or suitable solution a developer, they can also be used for printing.

[0082]

[Example] Although an example explains this invention still more concretely below, of course, the range of this invention is not limited by these.

[Examples 1-8, the examples 1-2 of comparison]

[0083] (Example of manufacture of a base material) JIS containing 99.5% or more of aluminum, Fe0.30% and Si0.10%, Ti0.02%, and Cu0.013% Pure processing was performed and the molten metal of A1050 alloy was cast. In order to remove unnecessary gas, such as hydrogen in a molten metal, for defecation processing, degasifying processing was carried out, and ceramic-tube filter processing was performed. Casting was performed by the direct chill casting process. 10mm facing of the ingot of 500mm of solidified board thickness was carried out from the front face, and homogenization was performed at 550 degrees C for 10 hours so that an intermetallic compound might not turn big and rough. Subsequently, it hot-rolled at 400 degrees C, after carrying out intermediate annealing for 500-degree-C 60 seconds in a continuous annealing furnace, it cold-rolled, and it considered as the aluminum rolled plate of 0.30mm of ****. By controlling the granularity of a reduction roll, center line average surface roughness Ra after cold rolling was controlled to 0.2 micrometers. Then, in order to raise smoothness, it applied to the tension leveler. [0084] Next, surface treatment for considering as the base material for the lithography versions was performed. First, in order to remove the rolling oil on the front face of an aluminum plate, indirect desulfurization fat processing was performed for 50-degree-C 30 seconds in sodium aluminate solution 10%, and the period sum and desmutting processing were performed for 50-degree-C 30 seconds in sulfuric-acid solution 30%.

[0085] Subsequently, in order to make good adhesion of a base material and an image formation layer and to give water retention to non-picture ****, the so-called graining processing which split-face-izes the front face of a base material was performed. Electrolysis grain reliance was performed by giving anode side quantity of electricity 240/dm² by the indirect electric supply cell by current density 20 A/dm² and the police box wave of duty ratio 1:1, having kept 1% of nitric acid, and the solution containing 0.5% of nitric-acid aluminum at 45 degrees C, and passing an aluminum web in solution. Etching processing was performed for 50-degree-C 30 seconds in sodium aluminate solution 10% after that, and the period sum and desmutting processing were performed for 50-degree-C 30 seconds in nitric-acid solution 30%.

[0086] In order to raise abrasion resistance, chemical resistance, and water retention furthermore, the oxide film was made to form in a base material according to anodic oxidation. The anodic oxide film of 2.5 g/m² was created by performing electrolysis processing by direct current of 14 A/dm² by the indirect electric supply cell, having used 20% solution of nitric acids at 35 degrees C as an electrolyte, and ****(ing) an aluminum web in an electrolyte. Silicate processing was performed in order to secure the hydrophilic property as printing version non-picture **** after this. Processing was ****(ed) so that 1.5% solution of No. 3 silicate of soda might be kept at 70 degrees C and the contact time of an aluminum web might become 15 seconds, and it was rinsed further. The coating weight of Si was 10 mg/m². Center line surface roughness Ra of the base material (1) produced as mentioned above was 0.25 micrometers.

[0087] (Synthetic example of synthetic example 1: acrylic polymer) the 4 mouth flask of 1L equipped with churning equipment, reflux equipment, a dryness nitrogen introduction pipe with temperature, and dropping equipment -- methylethyl KECHITON 400g -- teaching -- 80 degrees C -- the temperature up was carried out Vinyltoluene 80g, 238.9g of ethyl methacrylates, 24.5g of methacrylic acids, 56.6g of ethyl acrylates, and the solution that often mixed azo iso screw butyronitrile 8g were dropped over 2 hours. adding azo iso screw butyronitrile 0.5g after 6-hour churning, and agitating further for 3 hours -- solid-content concentration -- 49.5%, acid-number 0.70 milliequivalent /g (polymer solid-state), and weight average molecular weight -- 40000 -- acrylic polymer was obtained Solid-content concentration was 120 degrees C, carried out weighing capacity of the sample after 1-hour dryness, and asked for it with the mass ratio while it carried out weighing capacity of the sample-solution 1 section. Weight

average molecular weight was measured by GPC, and the molecular weight of polystyrene conversion had and described it. The acid number carried out the basis weight of the sample solution of the specified quantity, and titrated and determined it in the solution of a 0.1-N sodium hydroxide.

[0088] (Synthetic example of synthetic example 2: acrylic polymer) Methyl-ethyl-ketone 400g was taught to the 4 mouth flask of 1L equipped with churning equipment, reflux equipment, a dryness nitrogen introduction pipe with a thermometer, and dropping equipment, and the temperature up was carried out to 80 degrees C. Styrene 80g, 238.9g [of ethyl methacrylates], N, and N-dimethylaminoethyl methacrylate 24.5g, 56.6g of ethyl acrylates, and the solution that often mixed azo iso screw butyronitrile 8g were dropped over 2 hours. after [6 hour churning] and azo iso screw butyronitrile 0.5g -- agitating further in addition for 3 hours -- solid-content concentration -- 49.5%, base-number 1.2 milliequivalent /g (polymer solid-state), and weight average molecular weight -- 20000 -- acrylic polymer was obtained The base number carried out weighing capacity of the sample solution of the specified quantity, and titrated and asked for it in 0.1-N hydrochloric-acid solution.

[0089] (Synthetic example of synthetic example 3: acrylic polymer) The methyl ethyl ketone was made the agitator, the temperature control machine, and the reaction container equipped with the reflux cooling pipe, and temperature was made into 75 degrees C, after carrying out a nitrogen purge, 82 weight sections preparation and. After adding the monomer solution which consists of the methoxy polyethylene-glycol methacrylate (-NK ester M-90 made from the new Nakamura chemical industry G) 59 weight section (30-mol %) 2-hydroxyethyl methacrylate 6 weight section (ten-mol %) n-butyl methacrylate 35 weight section (60-mol %), and the azobisisobutyronitril 0.7 weight section over 3 hours here, 1-hour and half churning was continued and the acrylic polymer of weight average molecular weight 20000 was obtained.

[0090] (Synthetic example of composite quantity 4: acrylic polymer) Methyl-ethyl-ketone 400g was taught to the 1L4 mouth flask equipped with churning equipment, reflux equipment, a dryness nitrogen introduction pipe with a thermometer, and dropping equipment, and the temperature up was carried out to 80 degrees C. The solution which often mixed methacrylic-acid 2-hydroxyethyl 151g, methacrylic-acid allyl-compound 78g, 11.1g [of methacrylic acids], and acrylonitrile 60.0g azo iso screw butyronitrile 8g was dropped over 2 hours. adding azo iso screw butyronitrile 0.5g after 6-hour churning, and agitating further for 3 hours -- solid-content concentration -- 49.5%, acid-number 0.43 milliequivalent /g (polymer solid-state), and weight average molecular weight -- 10000 -- acrylic polymer was obtained Solid-content concentration was 120 degrees C, carried out weighing capacity of the sample after 1-hour dryness, and asked for it with the mass ratio while it carried out weighing capacity of the sample-solution about 1 section. Weight average molecular weight was measured by GPC, and the molecular weight of polystyrene conversion had and described it. The acid number carried out weighing capacity of the sample solution of the specified quantity, and titrated and asked for it in the solution of a 0.1-N sodium hydroxide.

[0091] (Synthetic example of synthetic example 5: acrylic polymer) 1-methoxy-2-propanol 400g was taught to the 4 mouth flask of 1L equipped with churning equipment, reflux equipment, a dryness nitrogen introduction pipe with a thermometer, and dropping equipment, and the temperature up was carried out to 80 degrees C. Methacrylic-acid 2-hydroxyethyl 100g, 238.9g of ethyl methacrylates, 56.6g of ethyl acrylates, 25g of acrylamide-isobutane sulfonic acids, and the solution that often mixed azo iso screw butyronitrile 8g were dropped over 2 hours. The acrylic polymer whose weight average molecular weight solid-content concentration is 49.5% and is 20000 was obtained by adding azo iso screw butyronitrile 0.5g after 6-hour churning, and agitating for further 3 hours. The acid numbers of the obtained polymer were 0.28 milliequivalents /g (polymer solid-state).

[0092] (Synthetic example of synthetic example 6: acrylic polymer) Methyl-cellosolve 400g was taught to the 4 mouth flask of 1L equipped with churning equipment, reflux equipment, a dryness nitrogen introduction pipe with a thermometer, and dropping equipment, and the temperature up was carried out to 80 degrees C. The solution which often mixed methacrylic-acid 2-hydroxyethyl 100g, 238.9g [of ethyl methacrylates], 56.6g [of ethyl acrylates], and acid phosphooxy propyl methacrylate 25g and azo iso screw butyronitrile 8g was dropped over 2 hours. The acrylic polymer whose weight average

molecular weight solid-content concentration is 49.5% and is 20000 was obtained by adding azo isobutyronitrile 0.5g after 6-hour churning, and agitating further for 3 hours. The acid numbers of the obtained polymer were 0.53 milliequivalents /g (polymer solid-state).

[0093] (Synthetic example of synthetic example 7: acrylic polymer) Having put polystyrene-g-polyethylene-glycol methacryloyl end polyethylene-glycol (Nippon Oil & Fats Co., Ltd. make, Mn=1000) 240g, styrene 500g, azobisisobutyronitrile 0.8g, 800ml [of water], and ethanol 800ml into the 3 TSU mouth flask, and pouring in nitrogen, dialysis filtration after 24-hour churning was performed at 60 degrees C, and the unreacted monomer was removed and refined. Thus, the solid-content concentration of the water-dispersion polymer which carried out the graft of the obtained polyethylene glycol was 13.5%.

[0094] (Synthetic example of synthetic example 8: acrylic polymer) After dissolving poly methyl acrylate-g-polyacrylamide acrylamide 30g in ethanol 70g, adding 3.8g of 3-mercaptopropionic acid and carrying out a temperature up to 60 degrees under nitrogen atmosphere, azobisisobutyronitrile 300mg was added and it was made to react at 60 degrees for 6 hours. The depositing white solid-state was filtered after the reaction end. When it washed enough and furthermore filtered and dried with the methanol, the polyacrylamide of an end carboxylic acid was obtained. End carboxylic-acid polyacrylamide 20g was dissolved in DMSO 62.3g, hydroquinone 62.4mg and glycidyl methacrylate 6.71g were added, N and N-dimethyl dodecyl amine 504mg was added to 130 degrees after the temperature up under nitrogen atmosphere, and it reacted at 130 degrees for 7 hours. It dried after reprecipitation with the acetone and the methacryloyl end polyacrylamide was obtained. Next, methacryloyl end polyacrylamide macroscopic monomer 3g obtained by doing in this way and methyl acrylate 4.5g were dissolved in ethanol 100g and 100g of water, and the initiator 2 and the solution which dissolved 2'-azobis [2-(2-imidazolyl-2-IRU) propane] 110mg in 20g of water were reacted at 75 more degrees after dropping over 2 hours for 5.5 hours by 75 degrees under nitrogen atmosphere. Thus, the graft of the polyacrylamide was carried out to the poly methyl acrylate front face. The solid-content concentration of this distributed liquid was 12.2%.

[0095] (Synthetic example of synthetic example 9: acrylic polymer) It changed to the acrylamide used in the example 3 of polymethylmethacrylate-g-PVP composition, and the methacryloyl end polyvinyl pyrrolidone was obtained like the synthetic example 3 except having used 1-vinyl-2-pyrrolidinone. Next, methacryloyl end polyvinyl-pyrrolidone macroscopic monomer 3g obtained by doing in this way and methyl methacrylate 4.5g were dissolved in ethanol 100g and 100g of water, and the initiator 2 and the solution which dissolved 2'-azobis [2-(2-imidazoline-2-IRU) propane] 110mg in 20g of water were reacted at 75 more degrees after dropping over about 2 hours for 5.5 hours by 7.5 degrees under nitrogen atmosphere. Thus, the graft of the polyvinyl pyrrolidone was carried out to the polymethylmethacrylate front face. The solid-content concentration of this distributed liquid was 12.3%.

[0096] (Synthetic example of a synthetic example 10: polyurethane particle) 33.5g of 533g and 2 of "bar knock DN-980 [the tradename of the poly isocyanate by Dainippon Ink & Chemicals, Inc.]", and 2-screw (hydroxymethyl) propionic acid, 0.05g of dibutyltin dilaurate, and 300g of ethyl acetate were added to the 4 mouth flask of 1L equipped with churning equipment, reflux equipment, the dryness nitrogen introduction pipe, and the thermometer, and it agitated at 80 degrees C for 3 hours. Ethanol 50g was added to ****, it stirred at 80 more degrees C for 1 hour, the end isocyanate was crushed, and it was made to deposit underwater. The acid numbers of the obtained polymer were 0.57 milliequivalents /g (polymer solid-state). Thus, the solution of a polyurethane prepolymer with which a dryness solid-content ratio becomes 6.80% of NCO content 50.0% was obtained. You made it react and NCO (isocyanate machine) content asked for the ethyl-acetate solution of the JI n butylamine of concentration known more superfluous than the isocyanate machine which carries out weighing capacity of the sample solution of the specified quantity, and measures it a constant rate, in addition by carrying out the back titration of the superfluous JI n butylamine in the hydrochloric-acid solution of concentration known.

[0097] (Synthetic example of a synthetic example 11: polyester particle) 397.6g of a terephthalic acid, 397.6g of an isophthalic acid, 144.9g of ethylene glycol, and 243.6g of neopentyl glycol were taught to the 4 mouth flask of 2L equipped with churning equipment, *****, the dryness nitrogen introduction

pipe, and the thermometer, and the temperature up was carried out to it to 160 degrees C. It agitated for further 4 hours, having added 30g of a xylene and carrying out azeotropy removal of the water at 260 degrees C, while replacing ***** with the decanter, after performing dehydration, adding 0.5g of dibutyl tin oxide and carrying out a temperature up over 6 hours to 260 degrees C. the last -- lowering the temperature -- 500g of a methyl ethyl ketone -- diluting -- acid-number 0.34 milliequivalent /g (polymer solid-state), and a dryness solid-content ratio -- the polyester which has a carboxyl group in 65.5% of both ends was obtained

[0098] (Manufacture of the polymer particles 1-14 containing a light-and-heat conversion agent) After dissolving 20g (after removing a solvent) of resins compounded in the synthetic examples 1-11 in 1-methoxy 2-propanol / 50g of water (8:2-fold quantitative ratio) solvents, the base or acid shown in Table 1 was added, and the infrared-absorption color further shown in Table 1 was added. 50g of solution which contains a water soluble resin 5% was added to this, and emulsification distribution was carried out for 15000rpm 15 minutes using the homogenizer. The particle which removes the organic solvent by agitating 60 degrees C for 3 hours, and is furthermore distributed in water under reduced pressure was obtained.

[0099]

[Table 1]

表-1

微粒子	高分子	塩基あるいは酸		赤外線吸収染料		水溶性樹脂
		種 類	添加量	種類	添加量	
1	合成例 1	トリエチルアミン	0.84 g	IR-28	2.5g	6"リアクリルアミド
2	合成例 2	パラトルエンスルホン酸	2.90 g	IR-26	2.5g	加酸"キシリチル"酸
3	合成例 3	—	—	IR-26	2.5g	6"リアクリル酸
4	合成例 4	テトラメチルアンモニウムヒドロキシド 15%水溶液	0.41 g	IR-28	2.5g	アセ"ア"ム
5 5' 5"	合成例 5	テトラメチルアンモニウムヒドロキシド 15%水溶液	4.40 g	IR-28	6 : 2.5g 5' : 1.2g 5" : 5.0g	6"リアクリルアミド 2-メ チル"ロハ"ン"酸
6	合成例 6	トリエチルアミン	0.69 g	IR-28	2.5g	6"リアクリルアミド 2-メ チル"ロハ"ン"酸
7	合成例 7	—	—	IR-28	2.5g	加酸"キシリチル"酸
8	合成例 8	—	—	IR-28	2.5g	6"リビ"ニヒ"ロリ"ン
9	合成例 9	—	—	IR-28	2.5g	6"リアクリルアミド
10	合成例 10	トリエチルアミン	1.04 g	IR-28	2.5g	アセ"ア"ム
11	合成例 11	トリエタノールアミン	1.01 g	IR-28	2.5g	アセ"ア"ム
12	合成例 5	テトラメチルアンモニウムヒドロキシド 16%水溶液	4.40 g	—	—	6"リアクリルアミド 2-メ チル"ロハ"ン"酸
13	合成例 5	—	—	IR-28	2.5g	6"リアクリルアミド 2-メ チル"ロハ"ン"酸
14	合成例 5	テトラメチルアンモニウムヒドロキシド 15%水溶液	4.40 g	IR-28	2.5g	6"リ"ニヒ"ロリ"ン

[0100] (Manufacture of the synthetic example 15 and the polymer particle 15) They are allyl-compound methacrylate / methyl methacrylate copolymer (copolymerization mole-ratios 70/30, mass average molecular weight 15000) 6.0g, and BAIONIN A-41C as an oil phase component. After dissolving 0.1g in 18.0g of ethyl acetate, it mixed in 36.0g of 4% solution of PVA205 of an aqueous-phase component, and emulsification distribution was carried out for 10 minutes by 10000rpm with the homogenizer. Then, ethyl acetate was evaporated, adding 24g of water and agitating for 90 minutes at 60 degrees C. The solid-content concentration of the obtained particle distribution liquid was 13.5 mass. Moreover, the mean particle diameter was 0.2 micrometers.

[0101] [Examples 1-19 and examples 1-5 of comparison] The original edition for the lithography versions was produced using the image formation layer application liquid of the following composition

by the combination of the surfactant shown in the polymer of the base material obtained in the above-mentioned example of manufacture, and a synthetic example, a polymer particle, and the following table 2.

(Formation of an image formation layer) The following prescription performed the above-mentioned particles 1-15, and it applied by the bar coating machine. Dryness was dried for 90 seconds at 60 degrees C in oven. The image formation layer dryness coverage was shown in Table 2.

[0102] <Image formation layer application liquid application liquid> water 20g particle 1g (solid content)

Surfactant 0.01g (solid content)

[0103] Do in this way. The obtained original edition for the lithography versions in which on-board development is possible in trend setter by Creo Co., Ltd. 3244VFS which carried water cooling type 40W infrared semiconductor laser After exposing on condition that output 9W, outside drum rotational frequency 210rpm, printing plate energy 100 mJ/cm², and resolution 2400dpi, After attaching in the cylinder of printing machine SOR-M made from high DERUBERUGU and supplying dampening water, without processing, ink was supplied and it printed by supplying paper further. About all negatives, on-board development could be carried out satisfactory and it was able to print. The number of sheets (****-proof) of printed matter and the level of the difficulty of becoming dirty which were obtained with each negative were evaluated. The absorbance applied image formation layer application liquid to the PET base, and measured the permeability of UV light in laser wavelength (the non-applied PET base was used as a reference). These evaluation results are shown in Table 2.

[0104]

[Table 2]

表-2

	微粒子	界面活性剤	水溶性赤外線吸収染料	塗布量 g/m ²	吸光度 (830nm)	印刷可能な枚数	汚れ難さ	塗布面状
実施例1	微粒子1	ノニオン型 ^{*1}	—	0.6	1.8	20000枚	よい	よい
実施例2	微粒子2	ノニオン型	—	0.6	1.2	15000枚	よい	よい
実施例3	微粒子3	アニオン型 ^{*2}	—	0.6	1.2	20000枚	よい	よい
実施例4	微粒子4	ノニオン型	—	0.6	1.8	30000枚	よい	よい
実施例5	微粒子5	ノニオン型	—	0.6	1.8	30000枚	よい	よい
実施例6	微粒子6	ノニオン型	—	0.6	1.8	20000枚	よい	よい
実施例7	微粒子7	ノニオン型	—	0.6	1.8	20000枚	よい	よい
実施例8	微粒子8	ノニオン型	—	0.6	1.8	15000枚	よい	よい
実施例9	微粒子9	ノニオン型	—	0.6	1.8	20000枚	よい	よい
実施例10	微粒子10	ノニオン型	—	0.6	1.8	25000枚	よい	よい
実施例11	微粒子11	ノニオン型	—	0.6	1.8	20000枚	よい	よい
実施例12	微粒子5	ノニオン型	—	0.6	0.5	15000枚	よい	よい
実施例15	微粒子5	ノニオン型	—	0.6	3.0	15000枚	よい	よい
実施例16	微粒子5'	ノニオン型	—	0.8	0.9	10000枚	よい	よい
実施例17	微粒子5''	ノニオン型	—	1.2	8.6	10000枚	よい	よい
実施例18	微粒子5	ノニオン型	IR-11	0.6	2.4	20000枚	よい	よい
実施例19	微粒子14	ノニオン型	—	0.6	1.8	15000枚	ややよい	よい
比較例1	微粒子12	ノニオン型	IR-11	0.6	1.8	5000枚	よい	よい
比較例2	微粒子13	ノニオン型	—	0.6	1.8	4000枚	悪い	よい
比較例3	微粒子15	ノニオン型	—	0.6	1.8	3000枚	悪い	よい
比較例4	微粒子5	弗素型 ^{*3}	—	0.6	1.8	14000枚	よい	ビニール有
比較例5	微粒子5	カチオン型 ^{*4}	—	0.6	1.8	20000枚	悪い	よい

(注) ^{*1} ノニオン型: ポリオキシエチレンノニルフェニルエーテル

^{*2} アニオン型: ドデシル硫酸ナトリウム

^{*3} 弗素型: メガファックF-171 (大日本インキ化学製)

^{*4} カチオン型: n-ドデシルメチルアンモニウムブロマイド

[0105] Each original edition for the lithography versions of the examples 1-19 of this invention was excellent in ****-proof, and the greasing was also good, and although the result which should be satisfied was obtained, each original edition for the lithography versions of the examples 1-5 of comparison was a dissatisfied result in dirt or ****-proof, so that clearly from the result of Table 2.

[0106]

[Effect of the Invention] As explained above, it is the original edition for the lithography versions of this invention. The surface hydrophilic-property particle which contains the polymer and the infrared-absorption color which have a hydrophilic graft machine in the polymer or the side chain which includes the composition unit which has (A) organic-salt structure in the image formation layer on a hydrophilic base material, and changes with heat to lipophilic property, (B) By making water-soluble polymer contain, good on-board development nature was shown and it became possible to prevent the printing dirt resulting from the polyvinyl alcohol or the surfactant used as an emulsification dispersant of the conventional polymer particle. Furthermore, the heat weld efficiency of the picture section heated by heat mode exposure etc. became possible [holding ****-proof / revenue] by introducing a light-and-heat conversion agent in a particle.

[Translation done.]